DOCUMENT RESUME

ED 357 789 JC 930 271

TITLE	Multi-Media Instruction: Vocational Education Research Package.
INSTITUTION	Evaluation and Training Inst., Los Angeles, Calif.
SPONS AGENCY	California Community Colleges, Sacramento. Office of the Chancellor.
PUB DATE	93
NOTE	19p.; Project supported by funds from the Carl D. Perkins Vocational Education and Applied Technology Act (Title II, Part A). Cover title varies slightly.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Audiovisual Instruction; Case Studies; Community Colleges; Computer Uses in Education; *Educational Resources; *Educational Technology; Instructional Innovation; *Multimedia Instruction; Program Descriptions; *Special Needs Students; Two Year Colleges; *Vocational Education
IDENTIFIERS	*California Community Colleges

ABSTRACT

Designed to assist community college administrators and faculty in enhancing vocational education programs and services, this resource package on multi-media instruction contains information on successful program strategies and ideas currently in use in vocational education programs in the California Community Colleges (CCC). Following a brief background narrative identifying the various types of multi-media instruction, this report presents individual case studies outlining the following multimedia efforts at CCC institutions: (1) the Multi-media Development Center at the College of San Mateo; (2) the Faculty Computer Network and communication development efforts at Pasadena City College; (3) a big screen projection system for computer instruction at El Camino College; (4) in-house software development at San Jose City College; (5) Instructional Media Services coordinating department at Los Angeles Trade-Technical College; (6) the Center for Computer Assisted Instruction and Vocational Education at Los Angeles Valley College; and (7) the High Tech Center for the Disabled, a cooperative project currently in place at nearly 90 CCC's which provides training in software applications for individuals with acquired brain injury or learning disabilities. The report includes a list of six key elements for effective multi-media instruction in vocational education, a brief list of resources with ordering information, and a list of contact people at the case study institutions. (PAA)

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Multimedia Instruction

VOCATIONAL EDUCATION RESOURCE PACKET

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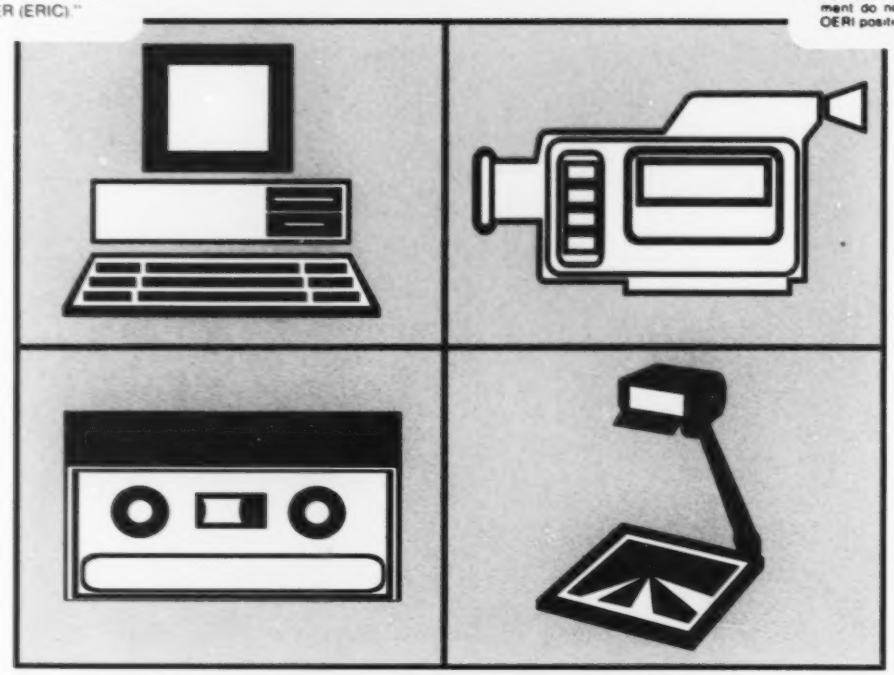

JC 930271

Chancellor's Office
California Community Colleges
1993

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VOCATIONAL EDUCATION RESOURCE PACKAGE

Multi-media Instruction

Prepared for the
Chancellor's Office of the
California Community Colleges

Prepared by the
Evaluation and Training Institute
12300 Wilshire Boulevard, Suite 420
Los Angeles, California 90025

1993

VOCATIONAL EDUCATION RESOURCE PACKAGES (VERPs)

Vocational Education Resource Packages (VERPs) are made available to the California Community Colleges through a special project grant. VERPs are designed to assist community college admi..istrators and faculty in enhancing vocational education programs and services, especially those serving special population students.

Each VERP contains information about successful program strategies and ideas currently in use in vocational education programs at the California Community Colleges. VERPs enable the dissemination of various program approaches to interested colleges, and provide resource materials to improve or develop programs which respond to local needs.

The VERPs are organized along thematic lines based on the needs of California Community Colleges. This VERP provides information on multi-media instruction.

VERP Titles	
Industry-Education Partnerships	Partnerships with the Public Sector
School-to-Work Transitions	Multi-media Instruction
Trends in Gender Equity	Promising Practices
Career Development	Staff Development
Rural Programs	Grant Writing

TECHNICAL ASSISTANCE

The special project grant that enabled the development and dissemination of the VERPs also provided for technical assistance. **Technical assistance services and workshops are available free of charge through June 1993.** The workshops and technical assistance will be provided by community college faculty and other resource people with relevant experience and know-how to share. Should your college wish to have an on-site workshop, or should you desire additional information, please contact:

Leslie Goldenberg
Evaluation and Training Institute
12300 Wilshire Boulevard, Suite 420
Los Angeles, California 90025
(310) 820-8521
(310) 207-2964 fax

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BACKGROUND

Multi-media instruction is defined as any kind of alternative instructional delivery system that involves supplementing traditional classroom teaching with technological support. Such instructional technology includes distance learning, computer aided instruction, videotapes, and audio labs to improve the basic skills of vocational education students or to simulate actual applications for technical skill areas. Examples of how various community colleges implement multi-media technology to improve instructional approaches and student comprehension are described below. A resource list of free or reasonably-priced products and services appears at the end of this VERP.

CASE STUDIES

The following case studies illustrate a variety of approaches to multi-media instruction.

College of San Mateo: Multi-media Development Center

The College of San Mateo (CSM) is at the forefront of multi-media instructional programming. CSM's involvement in interactive video and computer-based instruction began in 1983, when their multi-media electronics training curriculum was first introduced. Since then, the electronics training program has been adopted by IBM, Motorola, and schools throughout the state of Wisconsin. CSM estimates that 10,000 people have completed the curriculum. From 300-500 CSM students complete the program each year.

The multi-media electronics training program encompasses the first year general electronics curriculum. It is a video-based program that students manipulate at a personal computer workstation. Although the program is self-paced, students are required to do three hours of work per week at the workstation.

While the program is utilized on an ongoing basis at CSM, its widest application has been in private companies, such as IBM, Hewlett-Packard, Apple Computer, and Litton, as well as many smaller firms. When working with an external company, CSM provides a turnkey

package of both the workstation and software. CSM also provides a roving instructor who visits each site on a scheduled basis. Students who need to ask questions between visits can reach the instructor through a telephone link.

The program was developed by CSM in cooperation with the state of Wisconsin. Several large electronics corporations provided funds to support its development. Since its pilot introduction in 1983, the program has been continually enhanced and modified to incorporate new information and to take advantage of new delivery technologies. The program is now marketed by a private company, earning royalties for CSM. The college continues to provide support services for the program.

The underlying vision of the multi-media electronics curriculum was that educational technology would engage students and empower instructors. As budget pressures have increased, the program has also been seen as a means to serve greater numbers of students more efficiently by freeing up instructors.

CSM continues to explore multi-media instructional opportunities. With greater numbers of students coming to the college in need of basic skills training, the multi-media development center is trying to serve instructors by finding new educational technology materials for them. The college also operates its own television station, KCSM, which provides a variety of tele-courses. Tele-courses (also known as distance learning) are useful for students who cannot get to campus. In some cases, students enroll and pay their fees at another community college in the area, but watch KCSM's educational broadcasts. The college is currently exploring "feedback loops," or methods for linking students back to the instructor, such as modems, E-mail, telephones, or imaging telephones. Future plans for KCSM call for the station to function as a center for training and community access cable for San Mateo County, providing tele-courses and training to both private industry and college students.

CSM attributes the success of its multi-media programs to their ability to fulfill a real and expanding need. The future-oriented thinking of the multi-media development center and KCSM staff keep the programs on the forward edge.

Pasadena City College: Faculty Computer Network/Communication Development

(PCC) has made a significant commitment to and investment in technological enhancements to the campus infrastructure. The main elements of PCC's program are:

- A faculty computer network;
- Media labs; and
- A campus fiber optic network.

The highlights of each are presented below.

Faculty Computer Network

This network allows instructors to create computer programs using the authoring process. Authoring consists of integrating text, video, sounds and graphics on the computer to generate a computer-based instructional package. Input from a variety of devices, such as laser disc players, are used in the authoring process.

Introducing the multi-media authoring system includes training college faculty to use the system. The college used Title 3 Instructional Improvement Funds to hire a part-time staff member to teach instructors how to use media technology, audio, and video in their teaching approaches. The faculty computer network is establishing a culture at the college in which instructors are eager to use the resource to develop multi-media packages for the classroom.

Media Labs

The multi-media resources at PCC also include a variety of technology labs such as a video editing lab, a computer-based graphics lab, production facilities, communication resources, and a computer aided design lab. A grant from a local private foundation allowed the college to develop the computer-based graphics lab on campus.

PCC's technological improvements and multi-media instructional resources have had a direct impact on vocational education instruction at

the college. Vocational education students comprise half of the student body at PCC, and vocational education applications have grown out of all of the media resources.

Fiber Optic Network

In addition to the network and labs, the college is currently undertaking a $100 million revitalization project which includes building new fiber optic networks as a link between the library resource center and the rest of the college. The fiber optic links will deliver information to all classrooms across the campus. The fiber optic equipment has enough bandwidth (the volume of information it can carry) to handle an information capacity beyond the campus' current needs, so that as communication needs expand in the future, the system will accommodate them. PCC is also equipping classrooms with projection systems and is exploring satellite uplink capabilities to expand the college's radio station and cable channel.

Instructional Resource personnel at PCC suggest that other colleges should consider expanding their communication systems. Specifically, they recommend installing extra pipe conduit whenever the college rebuilds or renovates in order to meet the need for future fiber-optic cable as information handling grows in importance. They also recommend that colleges concentrate on developing networks on their campuses through communication technology and resources, helping to unify instructors and make resources available to all.

El Camino College: Big Screen Projection

In devising computer technology courses, instructors within the Industry and Technology Division at El Camino College decided that the material they needed to teach was not conducive to a traditional lecture format. The material required demonstration in order for students to learn how to use computer systems in fields such as computer aided design and drafting, and computer aided manufacturing. Demonstrations using one computer could only serve a few students at a time, however, not a class of 25 to 35 students.

In 1985, El Camino College acquired a big screen projection system which interfaces with a computer to enable an entire class to take part in

an instructor's demonstration of computer use. The system was purchased with state and federal equipment funds. An additional system was recently donated by IBM.

El Camino houses the projection systems in separate lecture rooms specifically set aside for lectures and labs involving computer aided demonstrations. Several departments share the equipment and coordinate in scheduling classes to ensure that each course receives the required hours of computer demonstration time. Students usually spend an average of 72 hours a semester in the big screen projection lecture/lab.

El Camino instructors consider the big screen projection system a superior method for teaching computer courses because it is accessible to a large class and allows for interaction between the students and instructor in creating new scenarios, asking questions, and solving problems with group input. The system also interfaces with video cassette recorders (VCR) and televisions to allow for video demonstrations when applicable to the course work. Enrollment in the college's computer aided skill courses **tripled** in five years, which the college party attributes to the better service students are obtaining from the new approach.

El Camino College's multi-media resources also include a Technical and Occupational Programs Laboratory (TOP LAB). The TOP LAB provides software tutorials, application programs, wordprocessing, databases, and spreadsheet software as well as instructional programs for particular vocational education areas. The TOP LAB also provides reading comprehension programs, math software, programs for students with low English proficiency and other basic skills programs for disadvantaged students in vocational education. Twelve computers are available in TOP LAB for students to use as a supplement to regular courses or on special direction from particular vocational education instructors. The use of TOP LAB is generally divided evenly between basic skills development and technical skills applications.

San Jose City College: In-house Software Development

In developing courses to make machining students computer literate and comfortable with the use of computer programmed machine tools, an instructor in the Machine Technology Department of San Jose City College (SJCC) identified the lack of available and affordable software to fit course needs as a major instructional obstacle. The instructor's solution was to create software applicable to specific courses.

The software developed is machine shop oriented and replaces textbook instruction with computer graphics and simulations. This format provides the student with the necessary instructional content while also introducing him/her to the computer. The software is used primarily for the simulation of computer aided design and manufacturing technology, the review of information, and the evaluation of student understanding through unit summaries which the students must complete. The simulations are particularly valuable because they expose the students to the cutting edge technologies, many of which are unavailable at the college.

Personnel in the Machine Technology Department at SJCC believe that developing in-house software should be considered when a college is trying to integrate multi-media instruction in a vocational education program.

Los Angeles Trade-Technical College: Instructional Media Services

Instructional Media Services (IMS) is located within the Learning Resources Center at Los Angeles Trade-Technical College (LATTC) and includes extensive audio-visual, graphic arts, and instructional television services. The IMS is responsible for the coordination, development and application of instructional media, and for the improvement of programs and materials designed for instructional use. IMS personnel assist faculty in their analysis of media needs, as they relate to the procurement or production of multi-media instructional materials.

Services to the faculty and students cover all types of audio-visual equipment and materials. For faculty, services include production of transparencies, charts, graphs, diagrams, audio-tapes and cassettes,

tele-lectures, as well as still and motion-picture photography. Instructional television services include distribution of off-air and videotaped programs to selected classrooms, videotaping facilities, and playback both in the studio or classroom and off the campus. A complete mobile color television van system is an integral part of the video capability of the college. The mobile unit allows the college to go to modern business or industrial facilities and videotape the equipment, technology and processes and use them as examples in the classroom.[1]

To encourage faculty to learn and use technology in the classroom, the college received a grant for instructional improvement in 1990 to establish the Center for the Advancement of Teaching with Technology (CATT). CATT staff teach faculty how to produce their own videos or other media-related instructional materials, and help faculty become more self-sufficient in using technological alternatives.

Los Angeles Valley College: Center for Computer Assisted Instruction and Vocational Education (CCAIVE)

The Center for Computer Assisted Instruction and Vocational Education (CCAIVE) was unveiled in 1986 as an open access resource center for all students interested in increasing their learning skills. The lab was opened with computers and software purchased with Vocational Education Act (VEA) funds. Currently, the college is in the final stages of updating the original equipment with 19 new state-of-the-art computers that are able to handle more sophisticated programs. The Center will also be equipped with an interactive laser disc player complete with voice activation abilities to aid in computer tutorials. The upgrades have been financed with nearly $85,000 in VATEA funds.

CCAIVE's software covers basic reading and writing, as well as tutorial programs for spreadsheet applications, word processing, databases, accounting, nursing, engineering, computer aided design, computer science information technology, and electronics. For non-native English speakers, software is available that provides tutoring in speaking, writing,

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[1] L.A. Trade-Technical College, 1992-93 Catalog, p.23.

reading, and using correct English grammar. Computers sound out individual words or sentences, making difficult sounds easier for students to learn. The Center also has acquired adaptive equipment for handicapped students such as computers with wheelchair access. CCAIVE employs a staff aide who is an expert in working with handicapped students. CCAIVE is used and valued by numerous vocational education departments.

The High Tech Center for the Disabled

The High Tech Center program is a cooperative project involving the support of several state agencies, including the Chancellor's Office, the California Department of Rehabilitation, the California Health and Welfare Agency, and the Community College Foundation. The program exists at nearly 90 community colleges. The assistive technologies provided by this program give disabled students access to computer resources. The program provides training in software applications for individuals with acquired brain injury (ABI) or learning disabilities (LD), and conducts research into new technologies for the disabled.

The High Tech Center Training Unit acts as a central information clearinghouse for all the High Tech Center programs. It provides multi-media instruction to faculty consisting of a two day overview of interactive instructional technology. The center has trained faculty from 89 California community colleges.

Individual programs supported by the high Tech Center include Adaptive Computer Technology (ACT), which is any addition to a computer program or device that allows a disabled student to see a computer monitor or use a keyboard. Another program focuses on providing services and software to students with ABI or LD. Besides offering daily support to professional and disabled students, the High Tech Center program publishes a bimonthly newsletter and an electronic bulletin board system to aid communication between sites and the Center. The Center is constantly researching new and emerging access and instructional technologies, providing information to the post-secondary educational system.

KEY ELEMENTS FOR EFFECTIVE MULTI-MEDIA INSTRUCTION IN VOCATIONAL EDUCATION

- Understand the needs of the college and be clear on educational goals. (Develop a strategic plan).
- Identify the technology to meet those needs.
- Review the strategic plan for instructional technology annually to set new goals or concentrate on specific areas, e.g. "explore new ways to present material through computers."
- Be responsive to industry and employment needs by tailoring technological instruction.
- Take advantage of the available video and software resources and the publications evaluating the products.
- Be aware of funding sources. Instructional technology can be funded through the Staff Development Funds (1725), VATEA funds, or appropriate grant sources.
- Build for the future in terms of fiber optic and information communication ability.

RESOURCE LIST

T.H.E. Journal (Technological Horizons in Education)

T.H.E. Journal
150 El Camino Real, Suite 112
Tustin, CA 92680-3670
(714) 730-4011

The Technological Horizons in Education Journal (T.H.E.) presents new technological developments, products and their educational application using understandable terms. The journal is published 11 times a year and features topics such as computer assisted English, cross-cultural transfer of programming language, statewide networks, electronic field trips, and multi-media in lecture halls, among others. Regular departments include Technology Trends, Software and Courseware, Applications, New Products, and other informational sections.

T.H.E. Journal offers a free one year subscription to qualified individuals in educational institutions and training departments. An application card must be filled out to receive a subscription. Call T.H.E. for information on subscriptions and application cards.

Modern Talking Picture Service

6735 San Fernando Road
Glendale, CA. 91201
1-800-243-MTPS
FAX (813) 546-0681

This service provides a wide variety of videos (e.g. auto, machining etc.) on a free loan basis. Titles can be ordered in advance for the entire semester.

Micro Computer Technology Application Users Guide

Contact: Tom Castaldo, Sierra College
(916) 624-3333

This resource was developed through a grant from the Chancellor's Office via Sierra Community College. It consists of evaluations of industry standard software in order to rate the usefulness of the software as an educational tool. Subject areas include auto mechanics, construction, drafting, electronics, manufacturing, and electronic publishing among others. The software evaluations are conducted by instructors in the respective skill areas. It includes a ranking of the software, evaluations, software prices, available discounts, and hardware requirements.

Society of Manufacturing Engineers

SME - Publications and Video Products
P.O. Box 77901
Detroit, Michigan 48277-0901
1-800-733-4SME

The Society of Manufacturing Engineers has developed extensive catalogs of videos available from SME, including instructional videos, field-trip videos which tour facilities and demonstrate technology, and self-guided instruction.

American Society for Metal

ASM International
Materials, Ohio 44073
Contact: Karen Germany, Education Department
(216) 338-5151

ASM offers a series of quality instructional materials and products related to metallurgy courses.

Anima Technical Computing

Dr. D.T.C. Porthouse
Anima Technical computing Limited, 23, Crawley Avenue.
Hebburn, Tyne and Wear, England
NE 31 2L2
International Phone #: (011) 44-91-483-2825

Anima develops software packages for use in computer aided manufacturing and machining. The software costs $150 per package and covers all computer aided manufacturing and machining areas, e.g. hydraulics, pneumatics, etc.

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